

MALARIA INCIDENCE AMONG A GROUP OF JORDANIAN MILITARY TROOPS IN SIERRA LEONE IN 2000

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ABSTRACT

Objective: To evaluate the efficacy of Mefloquine as a prophylactic treatment against malaria among Jordanian soldiers in Sierra Leone.

Methods: This is a retrospective study of 756 Jordanian soldiers among United Nations troops of Peace keeping forces in Sierra Leone, during a period of eight months extending from April until December 2000. All soldiers were given Mefloquine as a chemoprophylaxis upon United Nations recommendations in conjunction with World Health Organization and Centers of Disease Control recommendations. Other preventive measures such as insect repellents and education were also instituted.

Results: Out of the 756 soldiers of the battalion, only 39 (5.1%) had laboratory confirmed malaria during this period, the patients who were diagnosed were admitted to the hospital with rapid improvement of their symptoms within two days of treatment, and by the seventh day all patients were free of any residual complaint.

Conclusion: Chemoprophylaxis with Mefloquine plus adequate preventive control measures against mosquito bites is not 100% effective to prevent falciparum malaria, but they reduce the incidence of the disease.

Key words: United Nation, Malaria, Mefloquine, Peace Keeping Forces

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Introduction

Malaria in humans is caused by one of four protozoan species of the genus *Plasmodium*: *P. falciparum*, *P. vivax*, *P. ovale*, or *P. malariae*. All species are transmitted through the bite of an infected female *Anopheles* mosquito. Occasionally, transmission occurs by blood transfusion, organ transplantation, needle sharing, or congenitally from mother to fetus. Although malaria can be a fatal disease as in West Africa mainly in Sierra Leone,⁽¹⁻³⁾

illness and death from malaria are largely preventable.^(4,5)

Worldwide Malaria affects 270 million people each year, and has a mortality rate of 1%. About 90% of Malaria cases and deaths are believed to occur in West Africa where the incidence rate without prophylaxis is estimated to be 1.4% per month.⁽⁶⁾ Travelers to this area have 1-4% chance to catch the disease.⁽⁷⁾ Malaria is found in all countries between the latitudes 30°S and 40°N and is

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considered a primary disease of hot humid countries at altitudes less than 2200 meters above mean sea level where conditions are ideal for prolific breeding of the mosquito *Anopheles*.⁽⁴⁾

Travelers from temperate climates where infection with *Plasmodium falciparum* is endemic are at particular risk of morbidity and mortality, chemoprophylaxis with an antimalarial drug is generally recommended by World Health Organization and Centers for Disease Control.

United Nations recommendations obliges all military personal to take chemoprophylaxis in malarious areas to reduce the non-battle casualties, and to take Mefloquine as a chemoprophylactic agent in the following regimen:

- The dosage is 250 mg (one tablet) once a week in the mission area.
- The first dose should be taken one week before arrival to the malaria-risk area.
- Dose should be taken once a week, at the same day of the week, while in the risk area.
- Dose should be taken once a week for four weeks after leaving the risk area.
- The drug to be taken on a full stomach with a full glass of liquid.

Methods

This is a retrospective study of 752 Jordanian military personal. The data was collected from the hospital medical records, the age range was 19-42 years and the mean age was 28 years.

All participants were among United Nations peace keeping forces in Sierra Leone, who were given Mefloquine during a period of eight months extending from April until December 2000, all personnel were enrolled in the study. Soldiers took the drug once weekly on Friday after lunch. All the soldiers were young and healthy according to medical examination done prior to the mission.

The protective measures against the vector of malaria and insects were applied through the following methods:

- Using the insect repellent on exposed parts of the body.
- Weekly lecture by the medical staff about malaria and benefit of personal protective measures and Mefloquine against disease.
- Medical staff was taking the drug in front of soldiers.

- The officers checked their soldiers daily that they used the bed nets at night.
- The soldiers were ordered to keep sleeves rolled down.
- Fumigation was done daily mainly in the evening when the mosquitoes were highly active.
- The sources, which attracted insects, were sprayed weekly.

All suspected malaria cases were laboratory tested by thick smear and / or rapid test. All laboratories confirmed malaria cases were admitted to hospital and started proper anti malarial treatment.

Results

Out of the 756 soldiers of the battalion, only 39 (5.1%) had clinically manifested malaria during this period. The species was *Plasmodium falciparum* (the evolution of symptoms in treated patients is illustrated in Table I).

Table I. Number of malaria cases with various presenting symptoms and the progressive disappearance of symptoms in the post-treatment period

Symptoms	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Chills	35	6	0	0	0	0
Fever	38	2	0	0	0	0
Sweating	28	8	0	0	0	0
Bone aches	38	12	2	0	0	0
Cough	10	4	1	0	0	0

Both fever and bone aches were the most frequent presenting symptoms of the disease (n=38) followed in order of frequency by chills (n=35) and sweating (n=28). The majority of patients felt well within 24 hours of starting treatment with dramatic improvement within the first two days and by the seventh day all patients were free of any residual symptoms.

Pallor, mild soft splenomegaly along with tinge of jaundice was seen in a considerable number of patients (n=38, n=38 and n=31 respectively). While the tinge of jaundice disappeared after initiating treatment, splenomegaly and hepatomegaly persisted for the next two to four weeks with slow regression in some patients (Table II).

Table II. Number of malaria cases with various presenting signs and the progressive disappearance of signs in the post treatment days

Initial signs	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Pallor	38	38	38	38	21	14
Splenomegaly	38	38	38	38	38	26
Hepatomegaly	17	17	17	12	10	9
Tinge of jaundice	31	28	4	0	0	0

Anemia was corrected in 37 patients within five days after treatment; mild hyperbilirubinemia disappeared within 48 hours of treatment (Table III). No side effects of anti malarial medications were reported.

Table III. Frequency of relevant laboratory results and their evolution during and after treatment among 39 Falciparum malaria cases

Laboratory Results	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Anemia	38	38	38	38	16	1
Bilirubin > 1 mg/dl	37	35	18	0	0	0

Discussion

Mefloquine is an orally administered blood schizontide for prophylaxis against malaria and for treatment. Studies between 1977 and 1988 demonstrated efficacy of Mefloquine against multidrug resistant Plasmodium falciparum. Several studies suggested high protective efficacy of Mefloquine more than 91% of travelers to areas with resistant Plasmodium falciparum, it was also effective against Plasmodium vivax.^(2,7,8,9)

Centers for Disease Control advice all travelers to take Mefloquine for prophylaxis against malaria and reported that Mefloquine has rarely been reported to cause serious side effects, such as seizures, depression, and psychosis.⁽¹⁰⁾ These serious side effects are more frequent with the higher doses used to treat malaria; few side effects occurred with the weekly prophylactic doses used to prevent malaria. The most common side effects reported by travelers taking Mefloquine include headache, nausea, dizziness, and difficulty in sleeping, anxiety, vivid dreams, and visual disturbances.⁽¹¹⁾

Higher incidence of malaria cases in the Jordanian Hospital in Sierra Leone between January 2002 and July 2002 and United States troops deployed in Somalia between December 1992 and May 1993

and others was low compliance with personal protective measures and chemoprophylaxis.^(7,12,13)

Mefloquine is eliminated slowly by the body and thus may stay in the body for a while even after the drug is discontinued. Therefore, side effects caused by Mefloquine may persist weeks to months after the drug has been stopped. The side effects of Mefloquine which occur with the weekly prophylactic dose (250mg) rarely necessitate discontinuation and replacement of Mefloquine with other prophylactic treatment. Most travelers taking Mefloquine do not have serious side effects necessitating stopping taking the drug.

Conclusion

Chemoprophylaxis with Mefloquine plus adequate preventive control measures against mosquito bites is not 100% effective to prevent falciparum malaria, but they reduce the incidence of the disease.

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